

## WELDING PROCEDURE SPECIFICATION

DATE:

8/10/2006

WPS - 9000-8 REV. NO.: 1 DATE: 8/10/2006 \*\*APPLICABILITY\*\*

WELDING PROCESS: STUD and STUD ASME: X AWS: OTHER:

**SUPPORTING PQR:** 900-8 9000-8-CD/V

JOINT: This WPS shall be used in conjunction with the General Welding Standards (GWS) and Welding Fabrication Procedure (WFP) sections and criteria for joint details, repairs, NDE, inspection etc.

Weld Joint Type: STUD Class: Capacitor Discharge Stud See GWS 1-06 and WFP's for joint details **Preparation:** Grind or wire brush **Root Opening:** N/A N/A **Backing:** N/A **Backgrind root:** N/A **Backing Mat.:** GTAW Flux: N/A **Bkgrd Method:** N/A **Backing Retainer:** N/A **FILLER METALS:** Class: SS 3xx- Stud SS 3xx-Stud and 1/4 **A No:** 8 SFA Class: N/A and N/A F No: N/A and N/A Size: #6 #8 5/16 Insert Desc.: N/A Weld Metal Thickness Ranges: Insert: N Size: N/A Flux: Type: N/A **AWS Root Pass:** thru Filler Metal Note: Male & Female Studs **AWS Balance:** 0 thru 0 **ASME Root Pass:** thru **ASME Balance:** 0 thru 0 **BASE MATERIAL P No.** 8 Gr No. N/A to: P No. 8 Gr No. N/A Spec. A-240 SS- Plate, sheet & stri Grade: All to: Spec. SS- 3xx-x Stud Grade: All **ASME:** 8 Qualified Pipe Dia. Range:  $\geq$  AWS: **Qualified Thickness Range: AWS:** 0.000 0.000 **ASME:** 0.040 thru 2.000 thru **QUALIFIED POSITIONS:** AWS: 1S, 2S, 4S **ASME:** 1S, 2S, 4S Vert. Prog.: N/A Preheat Min. Temp.: 50°F **GAS: Shielding:** N/A N/A or 0 0 0 % **Interpass Max. Temp.:** 350°F Gas Composition: / % 50°F 0 **Preheat Maintenance:** Gas Flow Rate cfh: to to 0 % PWHT: Time @ °F Temp. N/A **Backing Gas/Comp:** N/A Temp. Range: N/A °F **Backing Gas Flow cfh:** 0 0 to  $0 \, ^{\circ} \mathbf{F}$ **Trailing Gas/Comp:** N/A % to

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Signatures on file at ENG

**APPROVAL:** 

WPS NO: 9000-8

WELDING CHARACTERISTICS:

PROCEDURE QUALIFIED FOR:

Current: DCEP and DCEP Tungsten Type: N/A Transfer Mode: N/A

Ranges: Amps 12 to Tungsten Dia.: Pulsing Cycle: 0 to 0

Volts 40 to Background Current: 0

Fuel Gas: N/A Flame: N/A Braze temp. °F 0 to 0

WELDING TECHNIQUE: For fabrication specific requirements sucg as fittup, cleaning, grinding, PWHT

and inspection criteria refer to Volume 2, Welding Fabrication Procedures

Technique: Semi-Auto Cleaning Method: Wire brush

Single Pass or Multi Pass: 0 Stringer or Weave bead (S/W): N/A Oscillation: 0

GMAW Gun Angle °: to Forehand or Backhand for GMAW (F/B): N/A

No Pass S>1/2": GMAW/FCAW Tube to work distance: N/A

Maximum K/J Heat Input: N/A Travel speed: N/A Gas Cup Size: N/A

Charpy "V" Notch: N Nil-Ductil Transition Temperature: N Dynamic Tear: N

Comments: Capicitor discharge studs using voltage or amperage values. No furrule or flux is used. Arc timing in Sec. #6 = .04, #8 = .06, 1/4=.07, 5/16 = .07. Power sources qualified are ESS 500/PW1000/CD 100/CD 512. Lift #8= 1/8, 1/4= 3/16, 5/16= 1/4/.028 standoff (tip).

Weld Layer	Manual Process	Filler Metals	Size	Amp Range	Volt Range	Travel/ipm	Nozzle Angle Other
1	STUD	SS 3xx- Stud	#6	12 <b>to</b> 15	40 <b>to</b> 70	0 <b>to</b> 0	to
2	STUD	SS 3xx-Stud	#8	15 <b>to</b> 30	50 <b>to</b> 80	0 <b>to</b> 0	
3 4	STUD	SS 3xx-Stud	1/4	20 <b>to</b> 40	60 <b>to</b> 90	0 <b>to</b> 0	
5	STUD	SS 3xx-Stud	5/16	30 <b>to</b> 50	70 <b>to</b> 100	to	
6							

REM. \* Weld layers are representative only - actual number of passes and layer sequence may vary due to variations in joint design, thickness and fitup.

Use of LANL Welding Procedures and Welder Qualifications for non-LANL work shall be at the sole risk and responsibility of the Subcontractor, and the Subcontractor shall indemnify and save LANL and the Government harmless from any and all claims, demands, actions or causes of action, and for any expense or loss by reason of Subcontractor's and their employees posession and use of LANL procedures and qualifications.

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